REMARKS

Reconsideration of this application and the rejection of claims 26-27, 29-31, 34-37, 39 and 43-44 and 46 are respectfully requested. Applicant has attempted to address every objection and ground for rejection in the Office Action dated August 5, 2005 (Paper No. 080305), and believes the application is now in condition for allowance. The claims have been amended to more clearly describe the present invention.

Claims 37-40, 43-44 and 46 stand rejected under 35 USC §112 as being indefinite. In claim 37, lines 11-12, "the end-point signal" lacks antecedent basis. As amended, the claim recites "the end-point detector and indicative of an end-point signal". In claim 46, lines 8-9, "the material deposition" is without antecedent basis. This claim has been amended to recite: "a material removal processing". Accordingly, the rejection based on Section 112 is respectfully traversed.

Claims 26, 27, 29-31, 34-37, 39, 43-44 and 46 stand rejected under 35 USC §102(b) as being anticipated by Li et al. (US 5,659,492). Li ('492) discloses a method and apparatus for determining the endpoint for the CMP of a film on a wafer. In Li ('492), the endpoint corresponds to a polishing time to reach reference point 100 plus an overpolishing interval 102. The reference point 100 is the point at which the film immediately under the sensor has been polished away. The overpolishing interval 102 is the amount of time that polishing is continued after the reference point 100 is reached. Li ('492) teaches that in order to successfully use the disclosed equations 1-5 that aid in determining the endpoint, the parameters must be set correctly. The true endpoint is determined by the following

parameters: N_{raw}, N_{ref}, Ref_y, t_{check}, t_{stop}, N_{jump}, $Jump_y$, $over_{ratio}$, and $over_{fixed}$. To ensure these parameters are set so that the true endpoint is successfully determined every time, practice polish runs are required. First, a trace that corresponds to the actual CMP process of a wafer must be obtained.

Li ('492) discloses two embodiments regarding the trace. First, an experienced operator/technician polishes the wafer with t_{check} and t_{stop} set to values large enough so that calculations are not made and polishing will not stop. The operator monitors the trace and polishing is manually stopped after an expected time has lapsed. The wafer is then cleaned and inspected and an additional polishing time is then determined based upon the experience of the operator.

The next embodiment disclosed by Li ('492), polishes the wafer in accordance with a polishing time set to an experienced-based safe value. The wafer is then inspected to determine if any residue (residuals of the upper layer that are to be removed during polishing) still remain. If no residue remains (the wafer is clean) another wafer may be polished with an earlier t_{stop} time. However, if residue still remains on the wafer, the polishing time should be increased for the next wafer. Wafers are then polished with different polishing times until an acceptable trace is obtained.

Li ('492) only discloses using film thickness as one of several values ultimately used to compute polishing time. The parameters $thick_{std}$ and $thick_{act}$ are the values of the industry standard of the film thickness for a wafer type and the actual film thickness of the

wafer being polished, respectively. These two parameters are used in equation four (4), which determines the overpolishing interval 102 and in equation five (5), which calculates the total polishing time. Li ('492) only discloses using values of film thickness ($thick_{std}$ and $thick_{act}$) that are known before processing starts. These thickness values are only used before processing starts to obtain a time period for the overpolishing interval and total polishing time. Further, Li ('492) does not utilize an integrated monitoring tool for measuring the thickness of the wafer after it is processed and then using this data to determine a correction value for the end-point signal. In fact, Li ('492) does not take any thickness measurements after the wafer has been polished. Nowhere does Li ('492) disclose or suggest monitoring the layer's thickness during processing under control of an endpoint signal.

In contrast, as recited in claim 26, the present invention, among other things, provides a method for monitoring a process sequentially applied to a stream of substantially identical articles by a processing tool, so as to terminate the operation of the processing tool upon detecting an end-point signal corresponding to a predetermined value of a thickness of a layer of the article being processed, the method comprising:

> (a) operating said processing tool to apply said process to the article, while continuously applying an end-point detector to said article under processing;
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> (b) in response to the end-point signal generated by the end-point detector, completing the processing of said article, and then applying an in-line monitoring by an integrated monitoring tool to

the processed article for measuring the thickness value resulting from the processing;

(c) analyzing the measured thickness value, and determining a correction value to be used for adjusting said end-point signal corresponding to the predetermined value of the thickness for terminating the processing of another article in the stream of articles.

Similarly, claim 37 recites, among other things:

(a) an end-point detector accommodated within a working area defined by the processing tool when applied to the article;

(b) an integrated monitoring tool accommodated within said processing tool outside said working area and capable of measuring a thickness of the article; and

(b) a control unit associated with the end-point detector and with the integrated monitoring tool, the control unit being in-line operative to be responsive to data coming from the end-point detector and indicative of an endpoint-signal for terminating the processing of the article, and to be responsive to the measured data coming from the integrated monitoring tool, so as to analyze these data and determine a correction value to be applied to the end-point signal corresponding to a predetermined value of the thickness of the article achieved by the processing thereof.

Also, claim 46 recites, among other things:

(a) an end-point detector accommodated within a working area defined by the processing when applied to the article;

(b) an integrated monitoring tool accommodated within said processing tool outside said working area and capable of applying in-line measurements of a thickness of the article under a material removal processing; and

(c) a control unit associated with the end-point detector and with the integrated monitoring tool, the control unit being responsive to data coming from the end-point signal for terminating the material removal of the article, and to the measured data coming from the integrated monitoring tool, so as to analyze these data and determine a correction value to be applied to the end-point signal corresponding to a predetermined value of the thickness of the article achieved by the processing thereof.

Li ('492) discloses the inspection of a polished wafer, wherein the polishing has been conducted in accordance with a polishing time set to an experience-based safe vale. The inspection consists of determining whether the wafer is already clean (i.e., has no residuals of the upper layer that are to be removed during polishing) or not; if the wafer is not completely polished (i.e., has residual portions remaining), the polishing time should be increased for the next polish run. Li ('492) fails to disclose or suggest the invention as recited in claims 26, 37 and 46, which incorporates, among other things, a polishing correction factor which is obtained during processing. Accordingly, the rejection based on Li ('492) is respectively traversed.

Claims 28, 38 and 40 stand rejected under 35 USC §103(a) as being obvious in view of a combination of Li as cited above in view of Moriyama et al. (US 5,609,511). The arguments asserted above traversing Li are reasserted here. Moriyama, whether taken alone or in combination with Li, fails to suggest or disclose the subject matter recited in claim 26, already argued to be patentable over Li. Accordingly, the rejection based on a combination of Moriyama and Li is respectfully traversed.

Applicant respectfully suggests that in the outstanding Action, the rejections evidence "picking and choosing" features of various references, taking them out of context and combining them when there is no suggestion in those references to do so. It is impermissible within the framework of a 35 U.S.C. § 103 rejection to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one skilled in the art. Neither Moriyama nor Li discloses or suggests the invention as now recited in the amended claims. Accordingly, the Section 103 rejection is respectfully traversed.

Applicant submits that in view of the above-identified amendments and remarks, the claims in their present form are patentably distinct over the art of record. Allowance of the rejected claims is respectfully requested. Should the Examiner discover

there are remaining issues which may be resolved by a telephone interview, he is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,

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December 5, 2005
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